

BASHKIROVA, G.M.; KHIMACH, M.A.; SHVARTS, V.T.; SHISHKIN, N.S.

How to bring about winter precipitation by means of Italian
hail-preventing rockets. Trudy GGO no.126:3-7 '62. (MIRA 15:7)
(Snow) (Weather control)

SHISHKIN, N.S.

Hail forecasting. Trudy GGO no.126:25-32 '62.
(Weather forecasting) (Hail)

(MIRA 15:7)

LENSHIN, V.T.; OSIPOVA, G.I.; SHISHKIN, N.S.

Quantitative forecasting of air-mass showers. Trudy GGO no.126:
33-39 '62. (MIRA 15:7)
(Weather forecasting) (Rain and rainfall)

SHISHKIN, N. S.

"Thunderstorm Theory."

report to be submitted for the ^{3rd} Intl. Conference on Atmospheric and Space Electricity,
Montreux, Switzerland, 6-10 May 1963.

ACCESSION NR: AT4011389

S/2531/63/000/145/0013/0019

AUTHOR: Shishkin, N. S.

TITLE: The theory of thunderstorm squalls

SOURCE: Leningrad. Glavnaya geofizicheskaya observatoriya. Trudy*, no. 145, 1963. Voprosy* fiziki oblakov i aktivny*kh vozdeystviy, 13-19

TOPIC TAGS: meteorology, thunderstorm, thunderstorm squall, thunderstorm formation, wind formation, atmospheric stratification, descending air flow

ABSTRACT: In 1958 (Shishkin, N. S. O roste i raspade konvektivny*kh oblakov pri neustoychivoy stratifikatsii atmosfery. Tr. GGO, vyp. 82, 1958), the author advanced a hypothesis linking the formation of strong wind squalls during thunderstorms with the development of convective descending streams in the Cb in the presence of unstable atmospheric stratification. In the sub-cloud layer there occurs a divergence of the descending flow, with transformation into a horizontal flow which, superimposing itself on the general shift of the air mass, is what in fact produces the wind squall. The velocity of the wind in squalls reaches, as is well known, 30-40 meters per second. The calculation of descending streams in clouds is similar to that used in the case of ascending streams and may be made according to the layer method (Shishkin, N. S. K raschetu skorosti vertikal'nogo

Card 1/4

ACCESSION NR: AT4011389

razvitiya konvektivnykh oblakov. Tr. GGO, vyp. 104, 1960). In this paper, the author describes a method for calculating the descending flows in convective clouds and considers an example of such a calculation for a storm-squall day (14 August 1961) in the area of the city of Voronezh. The layer method gives the following expression for the change in the kinetic energy of unit mass of cloud air when rising to height Δh :

$$\Delta \left(\frac{v^2}{2} \right) = \frac{g \Delta h}{6T_0} \sum_{k=1}^n |(T_s - T)_k - S_0(T_s - T_c)_k|$$

where g is the acceleration due to gravity; T_0 is the absolute temperature at the level of the cloud formation; T_k is the air temperature at the upper boundary of the k -th layer; T_{BK} and T_{CK} are the temperature of the air rising from the lower to the upper boundary of the k -th layer on a wet and dry adiabatic curve, respectively. To explain the conditions for the development in clouds of descending movements, a model is proposed in which a convective cloud develops in a three-layer atmosphere. Beneath the cloud, the vertical gradient of temperature is dry-adiabatic; above, the gradient γ is constant and contained within the limits $\gamma_B < \gamma < \gamma_C$, but beginning with a certain level $\gamma \leq \gamma_B$ (γ_B and γ_C are the wet-adiabatic and dry-adiabatic temperature gradients). In the second layer, the cloud has a cylindrical form, and in the third it forms an anvil. On the basis of this model an equation is derived for the kinetic energies of a unit mass of

Card 2/4

ACCESSION NR: AT4011389

cloud air with the cloud mass descending to Δh in a cloud of power h and with initial development of the cloud to height Δh :

$$\frac{\Delta \left(\frac{v_b^2}{2} \right)_h}{\Delta \left(\frac{v_b^2}{2} \right)_0} = 3 - \frac{\Delta h}{h} \quad (2)$$

(Note: the letter "B" beneath the "v" indicates the wet-adiabatic factor). It is found that for the development of a rather intensive descending stream an essential factor is the possibility of protracted drawing-in of the cloud air into the stream. In the case of cumulo-nimbus clouds this provision is present. For clouds with small horizontal section, the descending stream, embracing the entire cloud, gives rise to rapid evaporation of the cloud mass. The reduction of the mass of cloud air participating in the circulation leads to a rapid attenuation of the downward flow. In the model considered, no attention was given to the influence of the fall of rain drops and their evaporation under the cloud on the development of convection in the cloud, it being merely noted that the falling of particles in the cloud may well be that perturbation which generates the descending flow. In the last part of the article, the author considers, in the light of the theoretical postulates established in the first part, the aerological conditions underlying the development of the hail storm with severe

Card 374

ACCESSION NR: AT4011389

wind squalls observed at the city of Voronezh on 14Aug61. The author concludes that the layer method provides an entirely probable explanation of wind squalls as the consequences of the development, in cumulo-nimbus clouds, of convection with an active descending flow and unstable stratification of the atmosphere. Orig. art. has: 3 figures, 1 table and 13 formulas.

ASSOCIATION: Glavnaya geofizicheskaya observatoriya, Leningrad (Main Geophysical Observatory)

SUBMITTED: 00

DATE ACQ: 24Feb64

ENCL: 00

SUB CODE: AS

NO REF SOV: 003

OTHER: 000

Card 4/4

ACCESSION NR: AT4011390

S/2531/63/000/145/0023/0029

AUTHOR: Shishkin, N. S.

TITLE: The mechanism of formation of thunderstorm phenomena

SOURCE: Leningrad. Glavnaya geofizicheskaya observatoriya. Trudy*, no. 145, 1963.
Voprosy* fiziki oblakov i aktivny*kh vozdeystviy, 23-29

TOPIC TAGS: meteorology, thunderstorm, thunderstorm formation, cloud particle,
cloud particle electrical charge, droplet coagulation

ABSTRACT: Thunderstorm phenomena arise as the result of two processes: charging of the cloud particles and the division of the charges in the cloud, leading to the creation of an intense electrical field. The second process is now generally accepted, but many hypotheses have been advanced to explain the mechanism whereby the cloud particles are charged. The concept of the role of droplet coagulation in the process of the formation of an anomalously intense electrical field which gives rise to thunderstorm manifestations, first put forward by Voyeykov (A. I. Voyeykov. Meteorologiya, Spb., 1904), was further developed by the author of the present article together with Ya. I. Frenkel' (Frenkel', Ya. I., Shishkin, N. S. Rol'koagulyatsii vodyany*kh kapel' v vozniknovenii grozovy*kh razryadov. Izv. AN SSSR, Ser. geog. i geofiz., v. 10, no. 4, 1946) and in a number of other works. The pre-
Card 1/3

ACCESSION NR: AT4011390

sent article is devoted to the introduction of a number of refinements, based on the experimental studies of cloud particle charges carried out in recent years into the hypothetical mechanism of storm formation. For small cloud particles, the charge is approximately proportional to the radius of the drops. The coagulation of drops with charges of the same sign leads to an accumulation of charges in large drops since, if one does not consider the loss of charges due to the capture of ions from the air and other processes, the charges of the coalescing drops are united and, consequently, the charge of the large drop will be roughly proportional to the cube of its radius. On the other hand, the coagulation of differently-charged droplets leads to their neutralization. In certain former works it was assumed that all cloud drops are negatively charged, with the magnitude of their charge determined by:

$$q = -\epsilon r,$$

where $\epsilon = 10^{-3}$ e.p.u. = the electrokinetic potential. While these calculations, naturally, yielded an excessively high charge value for rain drops in the cloud and required revision in the light of fresh data on cloud charging, the mechanism itself, leading to the redistribution of charges in the cloud, was apparently described correctly. In moderate latitudes, storm phenomena almost always (apart from storms related to volcanic activity and blizzards) develop in clouds of mixed structure; however, the role of the liquid and solid phase in storm evolution is not yet clear. Conditions for the formation of a high electrical field intensity

Card 2/3

ACCESSION NR: AT4011390

in the cloud are most favorable when large precipitating particles are located, during the entire span of their existence, in a zone where the cloud particles are similarly charged; that is to say, where their fundamental coagulative growth occurs in a zone with one predominating charge sign. On the other hand, degradation of precipitation particles in the upper part of the cloud, in the presence of a height distribution of differently charged drops, impedes the development of storm phenomena. Original article has: 1 table, 1 figure, and 3 formulas.

ASSOCIATION: Glavnaya geofizicheskaya observatoriya, Leningrad (Main Geophysical Observatory)

SUBMITTED: 00

DATE ACQ: 24Feb64

ENCL: 00

SUB CODE: AS

NO REF SOV: 021

OTHER: 011

Card 3/3

SHISHKIN, Nikolay Sergeyevich; MATVEYEV, L.T., otv. red.; BELEN'KAYA,
L.L., red.

[Clouds, precipitation and thundrstorm electricity] Oblaka,
osadki i grozovoe elektrichestvo. 2. perer. i dop. izd. Le-
ningrad, Gidrometeoizdat, 1964. 400 p. (MIRA 17:5)

GROMOVA, T.N.; KRASIKOV, P.N.; LENSIN, V.T.; SHISHKIN, N.S.

Experiments on the effect of a colloidal solution of silver iodide
on supercooled clouds. Trudy GGO no.156:23-30 '64.

(MIRA 17:10)

L 51060-65 EWT(1)/EWG(v)/FCC/EEG(t) Pe-5/Pae-2 GW

AM4046250

BOOK EXPLOITATION

S/

20

B+1

Shishkin, Nikolay Sergeyevich

Clouds, precipitation, and thunderstorm electricity (Oblaka, osadki i grozovoye elektrichestvo) (2nd ed., rev. and enl.) Leningrad, Gidrometeoizdat, 1964. 400 p. illus., biblio. 1250 copies printed. Managing editor: L.L. Belen'kaya; Technical editor: G. V. Ivkova; Proofreaders: T. V. Alekseyeva, T. S. Poltavets

TOPIC TAGS: cloud, precipitation, electrical storm, hydrometeor, convective cloudiness, condensation, coagulation

PURPOSE AND COVERAGE: This monograph was written for meteorologists and geophysicists, as well as for general research personnel, instructors at vuzes and technicums, and graduate and senior students at universities and special vuzes. The physical phenomena occurring in clouds and leading to the formation of precipitation and of electrical storms are described, and the bases of the theory of these phenomena and certain problems of active reactions in a cloud are described.

Card 1/3

L 51060-65
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Principal attention is directed toward Soviet studies.

TABLE OF CONTENTS:

Introduction -- 3

Ch. I. General information concerning clouds and precipitation -- 10

Ch. II. Contemporary methods of investigating clouds and precipitation -- 48

Ch. III. The structure of clouds -- 77

Ch. IV. Laboratory investigations of processes participating in cloud formation

Ch. V. Regularities of phase transformations of hydrometeors -- 136 -- 107

Ch. VI. Thermodynamic conditions for the formation, development, and dissipation
of convective cloudiness -- 151

Ch. VII. Condensation growth of cloud particles -- 185

Ch. VIII. Coagulation growth of cloud particles -- 226

Ch. IX. Bases of the theory of summer clouds -- 251

Ch. X. Active interactions on a cloud -- 286

Ch. XI. Electrical structure of clouds -- 317

Ch. XII. Bases of the theory of electrical storms -- 342

Literature -- 370

Card 2/3

L 51060-65

AM4046250

SUB CODE: ES

SUBMITTED: 17Feb64

NR REF SOV: 413

OTHER: 351

50B
Card 3/3

SOV/78-3-9-12/38

AUTHORS: Shishkin, N. V., (Deceased) Krogius, Ye. A., Finikov, V. G.

TITLE: On the Nature of Some Iron Phosphates (O prirode nekotorykh fosfatov zheleza)

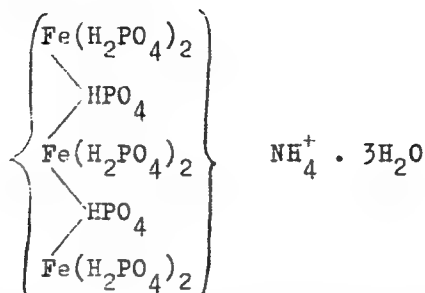
PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 9, pp 2075-208; (USSR)

ABSTRACT: The nature of iron phosphates and their kinetic interaction were investigated microscopically and by the determination of several physical properties of the solid phases formed. Iron phosphate of the formula $3\text{Fe}_2\text{O}_3 \cdot 8\text{P}_2\text{O}_5 \cdot 23\text{H}_2\text{O}$ was prepared and its oxonium nature was ascertained. The ammonium salt of this phosphate was prepared and its formula was determined to be: $3\text{Fe}_2\text{O}_3 \cdot 8\text{P}_2\text{O}_5 \cdot (\text{NH}_4)_2\text{O} \cdot 20\text{H}_2\text{O}$.
The rational formula is as follows:

Card 1/4

SOV/78-3-9-12/38

On the Nature of Some Iron Phosphates



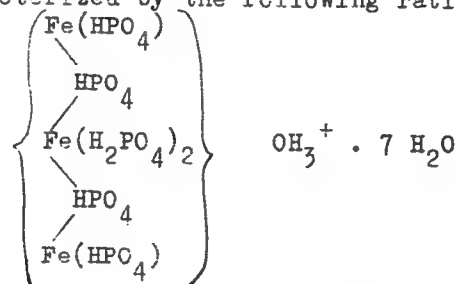
The two compounds crystallize in a hexagonal system. The specific weight of the compound $3\text{Fe}_2\text{O}_3 \cdot 8\text{P}_2\text{O}_5 \cdot 23\text{H}_2\text{O}$ at 25°C is $2,29 \text{ g/cm}^3$; the refractive index is 1,63. The specific weight of the compound $3\text{Fe}_2\text{O}_3 \cdot 8\text{P}_2\text{O}_5 \cdot (\text{NH}_4)_2\text{O} \cdot 20\text{H}_2\text{O}$ is $2,32 \text{ g/cm}^3$, the refractive index is 1,604. By Erlenmayer's method Winkler salt was prepared from 48% solution of H_3PO_4 . This salt has the following composition: 18,7% Fe and 63,7% PO_4 . The formula suggested by Winkler $3\text{Fe}_2\text{O}_3 \cdot 6\text{P}_2\text{O}_5 \cdot 25\text{H}_2\text{O}$ with 3% Fe_2O_3 and 6% P_2O_5 was corrected and its oxonium nature was explained, which

Card 2/4

On the Nature of Some Iron Phosphates

SOV/78-3-9-12/38

is characterized by the following rational-chemical formula:



The results obtained make necessary a correction of some empirical formulae of the phosphates described in publications. There are 5 tables and 7 references, 3 of which are Soviet.

ASSOCIATION: Saratovskiy gosudarstvennyy universitet imeni N. G. Chernyshevskogo (Saratov State University imeni N. G. Chernyshevskiy)

Card 3/4

MILAGIN, M.F.; SHISHKIN, N.Ye.

Tensile strength and birefringence of drawn out (oriented)
polymethyl methacrylate. Fiz.tver.tela 4 no.10:2689-2691 0 '62.
(MIRA 15:12)

1. Fiziko-tekhnicheskiy institut imeni A.F.Ioffe AN SSSR,
Leningrad.

(Methacrylic acid--Optical properties)
(Strength of materials)

KOZHEVNIKOVA, Naina Ioniforovna; KOSITSKAYA, V.I. Ispolniva funktsii

SHISHKIN, Nikolay Yefimovich IGAT'YEVA, A.V., red.;

~~KONCHIKOVA, I.Yev, red.~~

[Fourier series and the Fourier integral. Field theory.
Analytic and special functions. Laplace transformation]
diady i integral Fur'ye. Teoriia polin. Analiticheski
spetsial'nye funktsii. Preobrazovanie Laplasa. Moskva,
Nauka, 1964. 183 p. (MIRA 18:2)

SHISHKIN, O.K.

Propagating garden roses in the Central Urals. Nauch. trety
AKKH no.24s94-100 '64 (MIRA 18e2)

KOPEL'MAN, Lembit Aleksandrovich; SHISHKIN, V.Yu., red.; ALABYSHEVA,
N.A., red.izd-va; GVIRTS, V.L., tekhn. red.

[Nomograms for calculating welded elements for brittle break-
down resistance at a low level of stress] Nomogrammy dlia ras-
cheta svarnykh elementov na soprotivliaemost' khrupkim raz-
ruzheniiam pri nizkom urovne napriazheniia. Leningrad, 1963.
10 p. (Leningradskii dom nauchno-tekhnicheskoi propagandy.
Obmen peredovym opytom. Seriia: Svarka, paika i rezka metal-
lov, no.6) (MIRA 17:4)

PARFENOV, A.; SHISHKIN, O.---

Seminar on automatic control of oil production. Izv. vys. ucheb.
zav.; neft' i gaz 3 no.4:112 '60. (MIRA 15:6)
(Oil fields—Production methods)
(Automatic control)

SHISHKIN, O. P.

36127 Energeticheskiye pokazateli clektrorigvoda stankov-kachalok. (Po povadu stat'i L.I. Shturmana "Energeticheskiye pokazateli asinkhronnykh dvigateley v privode stankov-kachalok" v zhurn. "Energet. byulleten'", 1949, No. 7). Energet byulleten', 1949, No. 10, S. 23-28.-Bibliogr: 6 nazv.

SO: Ietopis' Zhrunal' nykh Statey, No. 49, 1949

SHISHEN, A. P.

30302

Ob udyeh' nykh raskhodakh elyektrede nyergii pri buryenii nyeftyanykh skvazhin. Enyergyet.
byullyetyen' 1949, No 9 S. 24-26

6 Mytallurgiya. Myetallovyedyeniye
b. Myetallovyedyeniye. Myetallografiya

SC: LETOPIS' No. 34

SHISHKIN, O. P.

1A 161T115

USSR/Petroleum - Power Norms, Electric
Oil Well Drilling

Apr 50

"Relation Between Electric Power Consumption Norms
and Drilling Speed and Hole Depth," O. P. Shishkin,
5½ pp

"Energet Byul" No 4

Existing methods for determining subject norms
have many drawbacks. Suggests new procedure, based
on two most important factors: drilling speed and
planned depth of well. Considers that other fac-
tors, such as rock hardness, and drill distortion,
are covered adequately by drilling speed.

161T115

Shishlin, O. P.

PA 240T50

USSR/Electricity - Induction Motors May 52
Engineering - Oil-Well

"Results of the Introduction of Synchronization
to the Grozny Oil Fields," Engr O. P. Shishlin,
"Grozneft," Association

"Elektrichestvo" No 5, pp 55, 56

Analyzes results from use of synchronization of
induction motors by DAG system at Grozny oil
fields, citing data on increase of the power fac
tor and reduction of capital expenditures on con
struction of high-voltage lines. From 1948 to

240T50

1951, 74 motors totalling 18,190 kva power were
synchronized. All enterprises of Ministry of
Petroleum Industry synchronized 340 large motors
averaging 200 kw each. Submitted 5 Jun 51.

240T50

1. SHISHKIN, O.P., RYZHIKOV, L.I.
2. USSR (600)
4. Groznyy - Petroleum Industry
7. Introducing schemes of automatic reclosing and automatic connecting of reserves power at the petroleum trust of the association Groznyy Petroleum. Energ.biul. no. 9, 1952
9. Monthly List of Russian Accessions, Library of Congress, February 1953, Unclassified.

SHISHKIN, O.P.

Introducing the synchronization of three-phase induction motors in enterprises of the Ministry of Petroleum Industry. Energ.biul. no.8:18-22
Ag '53. (MLRA 6:8)

(Electric motors, Induction)

UVAROV, I.B.; SHISHKIN, O.P.

Consumption of electric energy in turbine and rotary boring. Energ.biul. no.
12:22-26 D '53. (MIRA 6:11)

(Petroleum--Well boring)

SHISHKIN, O. P.

AID P - 787

Subject : USSR/Electricity

Card 1/1 Pub. 28 - 2/5

Authors : Kachan, I. K., Marchenko, D. A., Anisimov, A. P.,
Shishkin, O. P. and Guterman, D. I.

Title : Experience in use of a movable electric substation for
electric power supply in oil fields

Periodical : Energ. byul. #2, 9-15, F 1954

Abstract : Brief description of electric substations, movable by
railroad or motor transport to a center of oil prospecting.
The substations have lower costs of construction and
operation than the stationary units. 4 photographs,
1 table and 2 Russian references in the text (1953).

Institution : Inter-Departmental Experimental and Technical Council of
the State Inspection of Electric Power and Power
Inspection (MES i EP)

Submitted : No date

SHISHKIN, O.P.

Relation of specific electric energy consumption to technological
indexes of deep-well pumping installations. *Energ. biul.* no.2:16-17
Mr '54.

(MLRA 7:3)

(Petroleum--Pumping)

SHISHKIN, O.P.; RYZHKOV, L.I.

Relay, protection with a rectified operative current, and with the use
of switch operating solenoids. Energ.biul. no.11:19-29 N '54.
(Electric relays) (MLRA 7:11)

SHISHKIN, O. P.

3

✓4025. ARRANGEMENT FOR RECTIFIED OPERATING CURRENT.

A. D. Smerechkov and O. P. Shishkin.

Eлект. Станции, 1958, No. 12, 40-2. In Russian.

Discusses arrangements for supplying direct current for control and protection of 35 and 6 kV substations. The normal rectifier is supplied from the station auxiliaries, but in emergency when the a.c. voltage becomes too low owing to overloading of station circuits a second, parallel rectifier, supplied from the secondaries of the current transformers of the incoming feeders through a saturated core voltage stabilizer, maintains the d.c. voltage. Results of measurements on current transformers of Russian make are discussed with respect to optimum circuit design. Experience was encouraging over two years, at the end of which 25 substations in the oil industry had this type of control current supply.

F. Busemann

gyp
Rd

AUTHOR: Shishkin, O.P.

90-58-7-3/8

TITLE: The Structure of a Formula for the Specific Consumption of Electric Power in Depth-Pumping Oil Extraction (O strukture formuly dlya udel'nogo raskhoda elektroenergii na glubinnonasosnyu dobychu nefti)

PERIODICAL: Energeticheskii Byulleten', 1958, Nr 7, pp 14-18 (USSR)

ABSTRACT: The author discusses Kulizade's formula and the view of the various writers - G.M. Stepanov and I.I. Ginzburg, S.B. Yenikayev, V.Ya. Myagkov and V.P. Rvachev - expressed in the subsequent open discussion. The main practical interest is not in the power consumption of individual wells but in that of a group of wells and, therefore, only the basic factors - average dynamic level of liquid in the wells, average daily output of the wells, average delivery factor of the pump - need be considered (secondary factors largely cancelling each other out over a number of wells in the group). The relation of these three basic factors to power consumption is discussed and two formulae (6 and 10) are given:

Card 1/2

90-58-7-3/8

The Structure of a Formula for the Specific Consumption of Electric Power in Depth-Pumping Oil Extraction

$$E = \frac{W}{QH} = 2.73 + \frac{(11 + \frac{2.2}{H})}{\sqrt{qa}} \quad (6)$$

and

$$E = \frac{19.6}{QH} + \frac{2.85}{a} \quad (10)$$

where E = specific electric power consumption in hrs/t m ;
 q = daily yield of the well in tons; H = depth of the pump lowering in km; a = delivery factor of the pump; W = consumption of electric power in kwh per well per day (a formula for W is also given). These two formulae says the author, are expressions of the same functional relation, and practice will show which one is most suitable. They could be used as a criterion for working out the average for each oil region and thereby of comparing the different regions, which is impossible at present with the cumbersome Orgenergoneft' method. There are 3 tables, 3 graphs, and 5 Soviet references.

Card 2/2

1. Electric power—Consumption—Theory

ZAMANSKIY, Mikhail Abramovich, dotsent; KULIZADE, Kezim Novruzovich, dotsent; MOVSESOV, Nerses Savadovich, inzh.; TARASOV, Dmitriy Aleksandrovich, dotsent; SHISHKIN, Oleg Petrovich, kand.tekhn. nauk; PARFENOV, A.I., dotsent, retsenzent; SVYATITSKAYA, K.P., vedushchiy red.; SHAKHMAIEVA, Ye.A., vedushchiy red.; MUKHINA, E.A., tekhn.red.

[Electric power supply and electric equipment of oil fields]
Elektrosnabzhenie i elektrooborudovanie neftiannykh promyslov.
Moskva, Gos.nauchno-tekh.izd-vo nef. i gorno-toplivnoi lit-ry,
1959. 476 p. (MIRA 13:2)

1. Zaveduyushchiy kafedroy elektrosnabzheniya i elektrooborudovaniya Groznenskogo neftyanogo instituta (for Parfenov).
(Electric lines) (Oil fields--Equipment and supplies)

MIKHAYLOV, L.L.; SHISHKIN, O.P.; OBIDNOV, B.I.

Some problems relative to complete automation. Neft. khoz.
38 no.9:9-12 S '60. (MIRA 13:9)

(Oil fields--Production methods)
(Automation)

SHISHKIN, Oleg Petrovich, kand. tekhn. nauk; KRIVUN, Zakhar
Nikolovich; FILIPENOK, T.G., red.

Remote control in the Grozny oil fields] Telemekhanika
i neftiannykh promyslakh Groznogo. Grozny, Checheno-
Ingushskoe knizhnoe izd-vo, 1961. 83 p. (MIRA 17:8)

1. Direktor Groznenskogo filiala Vsesoyuznogo nauchno-
issledovatel'skogo instituta kompleksnoy avtomatizatsii
neftyanoy i gazovoy promyshlennosti (for Shishkin). 2. Na-
chal'nik otдела telemekhaniki Groznenskogo filiala Vse-
soyuznogo nauchno-issledovatel'skogo instituta kompleksnoy
avtomatizatsii neftyanoy i gazovoy promyshlennosti (for
Krikun).

SHISHKIN, O.P., GRACHEV, B.A.

Theory of an a.c. galvanic communication channel with well bottoms.
Izv. vys. ucheb. zav.; nef't' i gaz 5 no.6:93-96 '62. (MIRA 16:5)

1. Groznenskiy nef'tyanoy institut i Groznenskiy filial Vsesoyuznogo
nauchno-issledovatel'skogo i proyektno-konstruktorskogo instituta
kompleksnoy avtomatizatsii nef'tyanoy i gazovoy promyshlennosti.
(Signals and signaling)

SHISHKIN, O.P.; GRACHEV, B.A.

Possibilities of creating a communication channel through
pipes in a well. Izv. vys. ucheb. zav.; neft' i gaz 5 no.7:
95-99 '62. (MIRA 16:7)

1. Groznenskiy neftyanoy institut i Groznenskiy filial
Vsesoyuznogo nauchno-issledovatel'skogo i proyektno-
konstruktorskogo instituta kompleksnoy avtomatizatsii neftyanoy
i gazovoy promyshlennosti.
(Signals and signaling)

SHISHKIN, O.P.; GRACHEV, B.A.; LEONOV, A.I.

Power of a signaling device using drill pipe as a galvanic circuit.
Izv. vys. ucheb. zav.; neft' i gaz 6 no.2:93-97 '63. (MIRA 16:5)

1. Groznenskiy neftyanoy institut i Groznenskiy filial Vsesoyuznogo
nauchno-issledovatel'skogo i proyektno-konstrukorskogo instituta
kompleksnoy avtomatizatsii neftyanoy i gazovoy promyshlennosti.
(Oil wells—Equipment and supplies)

SHISHKIN, P.; YESIFOV, F.T.; BOROVITIN, P.P.; KHOKHLOV, V.A.;
GRINER, V., red.

[Ways of reducing losses of metallic supports in mines of
the "Vorkutugol'" Combine] Puti snizheniia poter' metalli-
cheskoi krep'i na shakhtakh kombinata Vorkutugol'. Syktyvkar,
Komi knizhnoe izd-vo, 1964. 40 p. (MIRA 18:4)

SHISHKIN, O.P.

Equivalent resistance of rocks in an electric communication channel
to the well bottom. Izv. vyss. ucheb. zav.; neft' i gaz 7 no.5:105-108
'64. (MIRA 17:9)

1. Groznenskiy neftyanoy institut.

SHISHKIN, Oleg Petrovich; PARFENOV, Afanasiy Nikolayevich;
AKIMOV, V.F., kand. tekhn. nauk; VRONSKIY, L.N., ved. red.

[Principles of automatic control and the automation of
industrial processes] Osnovy avtomatiki i avtomatizatsiia
proizvodstvennykh protsessov. Moskva, Nedra, 1965. 340 p.
(MIRA 18:5)

1. Gosudarstvennyy vsesoyuznyy issledovatel'skiy i proyektnyy
institut neftyanoy promyshlennosti (for Akimov).

SHISHKIN, P.A.
Measurement of the temperature of flowing gases. P.
A. Shishkin. Zhuravskaya Lab. S. 07(1980). App. is
described. B. C. A.

ASH 51A METALLURGICAL LITERATURE CLASSIFICATION

YEROSHEVSKIY, T. I. (PROF.), SHISHKIN, P. A.

Ophthalmology

Ophthalmologic aid at the great communist
construction projects; Kuybyshev Hydroelectric
Power Station. Vest.oft. 31 no. 3, 1952

Monthly List of Russian Accessions, Library of Congress
August, 1952. UNCLASSIFIED.

YEROSHEVSKIY, T.I., professor, zaveduyushchiy; SHISHKIN, P.A., kandidat meditsinskikh nauk.

Results of work of ophthalmologic interns and of 5th year students in a rural center. Vest.oft. 32 no.3:15-17 My-Je '53. (MLBA 6:8)

1. Kafedra glaznykh bolezney Kuybyshevskogo meditsinskogo instituta.
(Ophthalmology)

KATORZHENOV, N.D.; PROKOF'YEVA, A.S.; KUPINSKIY, R.V.; SHISHKIN, P.M.
DVORNITSKIY, G.S.; NOVIKOV, N.A.

Technological layout for the continuous production line of capron
staple fiber. Khim.volok. no.3:11-15 '59. (MIRA 12:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut isskusstvennogo
volokna (VNIIV).

(Nylon)

SHISHKIN, P. N.

Shishkin, P. N. "On the etiology and treatment of cystitis," Voprosy dermato-venerologii, Vol. IV, 1948, p. 44-48, - Biblog: 8 items.

SO: U3736, 21 May 53, (Letopis 'Zhurnal 'Nykh Statey, No. 18, 1949).

SHISHKIN, P. N.

Shishkin, P. N. "A case of gonorrheal ulcer of the vulva," (In index: P. Ye. Shishkin),
Voprosy dermato-venerologii, Vol. IV, 1948, p. 11/-19.

SO: U-3736, 21 May 53, (Letopis 'Zhurnal 'nykh 'tatey, No. 13, 1949).

SHISHKIN, P.N., starshiy nauchnyy sotrudnik; KADYSEVA, Ye.A., kand.med.nauk;
FEDOROVA, G.B., vrach

Treatment of seborrhea of the scalp with sulsen. Vest.derm.i
ven. no.7:49-50 '61. (MIRA 15:5)

1. Iz Ufinskogo nauchno-issledovatel'skogo kozhno-venerologicheskogo
instituta (dir. - starshiy nauchnyy sotrudnik P.N. Shishkin),
kafedry kozhnykh bolezney (zav. - prof. G.S. Maskimov) Bashkirskogo
meditsinskogo instituta i mikologicheskoy detskoy bol'nitsy
(glavnyy vrach M.Kh. Malyshev).

(SELENIUM SULFIDE--THERAPEUTIC USE) (SCALP--DISEASES)

SHISHKIN, F.T., MOSCOW, U.S.S.R.

Methods for determining argon in rocks. Moscow, 1961. 18 p. abs. vopr.
geol. nauk. no. 401-402 1961 (MIRA 18:1)

ORLOVA, N.I.; SHISHKIN, P.T.

Energy structure of δ -SiC. Izv. AN Uz.SSR.Ser.fiz.-mat.nauk 8
no.4:53-61 '64. (MIRA 18:3)

KOLKUNTSOV, G., inzh.; KABAN, N., inzh.; SHISHKIN, R., inzh.

Reinforced concrete girders for buildings with flat roofs.

Na stroi.Ros. 3 no.6:19-20 Je 62. (MIRA 16:7)

(Reinforced concrete construction) (Roofs) (Beams and girders)

NIKITIN, N.V., inzhener, laureat Stalinskoy premii; SHISHKIN, R.G., inzhener.

Large panel KPP beamless slab construction for industrial buildings. Biul.
stroi.tekh. 10 no.13:1-3 Ag '53. (MLBA 6:10)

1. Promstroyproyekt.

(Reinforced concrete construction)

KOZLOV, V. A.; FRENKEL', P. M.; SHISHKIN, R. G.; Engs.

Rolling mills

Problems of laying and of planning industrial construction of rolling mill foundations,
Stroi.prom. 31, no. 2, 1953.

Monthly List of Russian Accessions, Library of Congress, June 1953. Unclassified.

SHISHKIN, R.G., inzhener.

Framework for walls faced with corrugated asbestos-cement sheets. Stroi.
prom. 31 no.11:41-43 N '53. (MLBA 6:12)

1. GPI Promstroyproyekt.

(Walls)

NIKITIN, N.V., inzhener; PETROVA, T.G., arkhitekto; SHISHKIN, R.G.,
inzhener; MAKARYCHEV, V.V., kandidat tekhnicheskikh nauk;
MATSELINSKIY, R.N., kandidat tekhnicheskikh nauk

Reinforced concrete ribbed panels for beamless floors of industrial buildings developed by the State Planning Institute of Industrial Construction and the Central Scientific Research Institute of Industrial Construction. Rats. i izobr. predl. v stroi. no. 81:8-10 '54. (MLRA 8:6)

1. Promstroyproyekt (for Nikitin, Petrova, Shishkin) 2.
TSentral'nyy nauchno-issledovatel'skiy institut promyshlennyykh sooruzhenii (for Makarychev, Matselinskiy).
(Floors, Concrete)

FRENKEL', P.M., inzhener; SHISHKIN, R.G., inzhener.

General design for foundations under steel rolling machinery.
Bat. 1 zhel.-bet. no.8:287-294 N '55. (MLRA 9:1)

(Rolling mills) (Foundations)

SHISHKIN, R.G., inzh.

Using reinforced concrete members as matrices in making construction elements. Biul. stroi. tekhn. 12 no.4:4-6 Ap '55. (MIRA 11:12)

1. Promstroyproyekt.

(Precast concrete)

NIKITIN, N.V., inzhener; SHISHKIN, R.G., inzhener.

~~SECRET~~
Prestressed reinforced concrete girders for arched roofs of industrial buildings. Stroil. prom. 34 no.9:19-23 S '56.

(MLRA 9:10)

(Prestressed concrete) (Roofing, Concrete)

SHISHKIN, R.G., inzhener.

~~SHISHKIN, R.G.~~
Experimental testing of stressed reinforced arch trusses in
building trusts. Stroi.prom. 35 no.6:10-16 Je '57. (MIRA 10:10)
(Trusses--Testing)

YAKUBANETS, S.; RUBTSOV, G.; BAL'NOV, M.; SHISHKIN, R.

Prestressed reinforced concrete large-span frames in Stalingrad and
Stalinsk. Stroitel' no.3:2-5 Mr '58. (MIRA 11:2)

1. Glavnyy inzhener tresta Stalingradmetallurgstroy (for Yakubanets).
2. Glavnyy tekhnolog tresta Stalingradmetallurgstroy. (for Rubtsov).
3. Glavnyy inzhener tresta Kuznetskiyazhstroy (for Bal'nov). 4. Glavnyy inzhener proyekta (for Shishkin)
(Stalingrad--Precast concrete) (Stalinsk--Precast concrete)

AUTHOR: Shishkin, R.G., Engineer SOV/97-4-2/11
Mizernyuk, B.N., Candidate of Mechanical Sciences.
Bal'nov, M.I., Engineer.

TITLE: Production and Application of Prestressed Reinforced Concrete Arched Frames with Batch Reinforcement. (Opyt izgotovleniya i primeneniya predvaritel'no napryazhennykh zhelezobetonnykh arochnykh ferm s puchkovoy armatyroy).

PERIODICAL: Beton i Zhelezobeton, 1958 Nr.4., pp. 125-131 (USSR).

ABSTRACT: The manufacture of prestressed concrete frames with batch reinforcement could be carried out in the yards of building organizations. The experience gained in the Kuznetskiyazhstroy trust show that the manufacture of complete frames spanning 27-30m could be accomplished if a railway siding were available. The advantages of these frames constructed as one unit are the economy in steel and saving of assembly time. A 70% saving of steel is achieved by the use of batch reinforcement as compared with steel frames. The channels in the constructions accomodating batch reinforcement should be formed without tubular steel insets using rubber tubes. The injecting of channels should be carried out through the

Card 1/3

SOV/97-4-2/11

Production and Application of Prestressed Reinforced Concrete
Arched Frames with Batch Reinforcement.

opening at the ends where the anchor is fixed. Constant control should be kept on the proportion of water and cement in the grout. The quality of the high tensile steel should also be checked in the laboratories for breaking point and the hardness, which is usually carried out by the Rockwell apparatus. The Institute of Promstroyproyekt designed a few variants of prestressed reinforced concrete arched frames for a 27m span. Samples of these frames were manufactured in Kuznetskiyazhstroy trust and were tested in the presence of the Siberian Branch of the VNIIPS. According to the results of these tests a frame was chosen and improved upon by the Promstroyproyekt(TCh III-57/MSPMKhP). This design was accepted by the Institute Giproclyuminiy for construction of the electrolysis department of the Stalinsk aluminium factory. Figure 1 gives constructional details of the frame. Steel Mark 25G2S was used. Figure 2 shows anchoring details for pretensioning of the reinforcement. Data for high tensile steel of various marks is given in Table 1. A visiting party of specialists from Gosstroy

Card 2/3

SOX/97-4-2/11

Production and Application of Prestressed Reinforced Concrete
Arched Frames with Batch Reinforcement.

helped the Kuznetskiyazhstroy trust to solve various technical problems in connection with casting arched frames. Figure 3 shows a photograph of the casting yard. Table 2 enumerates tools, implements and heavy gear used in such a yard. Figure 4 illustrates frame with tubular insets for the formation of channels and Figure 5 the frame where the channels are being formed by means of rubber tubing. The cement used for the concrete mix for these frames is Mark 400, which is re-ground on vibro grinders M-200. The consolidation of the concrete is carried out by an immersion type of rod vibrator Mark I-21, I-50 and I-80. The tensioning of the reinforcement is carried out by hydraulic jacks constructed by the Glavstroy Mekhanizatsiya with a tensioning capacity of 30 tons, operated by hand pumps, SM-258. Figure 6 illustrates the end of the frame with anchor reinforcement and Figure 7 the lifting of the frame by crane on a special attachment. Figure 8 illustrates the transportation of the frames by railway and Figure 9 the frame during testing. Table 3 gives cost estimate of various manufacturing operations of the frame for a 27m span. There are 9 figures and 3 tables. 1. Reinforced concrete--Applications 2. Reinforced concrete--Production 3. Structures--Design

Card 3/3

DAVYDOV, S.S.; VASIL'YEV, A.P.; SHISHKIN, R.G.

International Congress on Prestressed Reinforced Concrete. From.
stroil. 36 no.12:36-43 D '58. (MIRA 12:1)
(Berlin--Prestressed concrete--Congresses)

NOV/97-59-1-1b/13

AUTHOR: None given

TITLE: Information from the Commission on Prestressed and Precast Reinforced Concrete Constructions (V komissii po predel'no napryazhennym i sbornym zhelezobetonnym konstruktivam)

PERIODICAL: Beton i Zhelezobeton, 1989, Nr 1, p 44 (USSR)

ABSTRACT: In December 1958 a session of the Commission on Prestressed and Precast Reinforced Concrete Construction was held in Moscow. This Commission was appointed by the Academy of Building and Architecture of USSR (Akademiya stroitel'stva i arkhitektury SSSR). The following papers were read: Program and Planning for 1959/1965 - A.A. Proskuryakov, Director of the Department of Concrete and Reinforced Concrete Constructions of Gosstroy of USSR; Report on the Commission's Activities in 1958 and Plans for 1959 - V.V. Bikhaylov and A.A. Gvozdev, Members of ASIA SSSR; Reports on the Third International Congress on Prestressed and Precast Reinforced Concrete - S.S. Davydov, Vice-President of ASIA SSSR; V.V. Bikhaylov, Member ASIA SSSR; and Card 1/2

A.P. Vasil'ev and K.O. Shishkin, Candidates of Technical Sciences - on methods of designing and casting pretensioned reinforced concrete constructions.

Card 2/2

SHISHKIN, R.

Using prestressed reinforced concrete girders in constructing
industrial buildings. Stroitel' no.12:3-6 D '59.
(MIRA 13:3)

1. Nachal'nik spetsial'nogo konstruktorskogo otdela Prom-
stroyproyekta. (Girders) (Industrial buildings)

BULGAKOV, V.S., kand.tekhn.nauk; SHISHKIN, R.G., inzh.

New types of joints of prestressed concrete construction elements.

Bet.1 zhel.-bet. no.12:553-557 D '60. (MIRA 13:11)

(Prestressed concrete construction)

DOBRYNIN, S.N.; SHISHKIN, R.G.; SUKHOV, A.P.

Construction of new industrial buildings in Canada. From.stroi.
38 no.2:54-61 '60. (MIRA 13:5)
(Canada--Industrial buildings)

SHISHKIN, R.G., inzh.

Transporting long precast reinforced concrete construction
elements of industrial buildings. Prom.stroi. 38 no.6:
33-36 '60. (MIRA 13:7)

1. Promstroyproyekt.
(Precast concrete—Transportation)

SHISHKIN, R.G., inzh.

Reinforced concrete elements for flat roofs. Bet. i zhel.-bet.
no.10:449-454 O '61. (MIRA 14:12)

(Roofs, Concrete)
(Concrete products)

ASVADUROV, D.S., inzh.; SHISHKIN, R.G., inzh.; OL'KHOV, V.I., inzh.

Use of suspended transportation in one-story industrial
buildings of the new type. Prom. stroi. 40 no.9:16-19
'62. (MIRA 15:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut
pod'yemno-transportnogo mashinostroyeniya (for Asvadurov).
2. Gosudarstvennyy institut po proyektirovaniyu promyshlennogo
stroitel'stva (for Shishkin, Ol'khov).
(Conveying machinery)

SHISHKIN, R.G., inzh.

Standard design details of one-story industrial buildings with
a flat roof. Prom.stroi. 40 no.11:7-14 '62. (MIRA 15:12)

1. Gosudarstvennyy institut po proyektirovaniyu promyshlennosto
stroitel'stva.

(Industrial buildings)

G.M. ALERO, G.G.; VASIL'YEV, A.P.; MIKHAYLOV, V.V.; PEREL'SHTEIN,
N.I. [deceased]; SLISHER, R.G.; YAKUBOVSKIY, B.V.;
MITNIK, G.S., kand. tekhn. nauk, nauchn. red.; KUZNETSOVA,
I.N., red.

[Prestressed reinforced concrete; based on materials at the
Fourth International Congress on Prestressed Reinforced
Concrete Structures held at Rome and Naples in 1962] Pred-
varitel'no napriazhennyi zhelezobeton; po materialam IV
Mezhdunarodnogo kongressa po predvaritel'no napriazhennym
zhelezobetonnym konstruktsiham (FIP), Rim-Neapol', 1962 g.
Moskva, Stroizdat, 1964. 281 p. (MIRA 17:10)

DEKHTYAR', A.I., inzh.; SHISHKIN, R.G., inzh.

Ten years' development of structural designing for industrial
construction. Prom. stroi. 41 no.8:5-8 Ag '64. (MIRA 17:11)

ALEVTSOV, V.A.; S. I. KIN, A.G.

Results of testing standard prestressed girders with parallel
booms. Prom. stroi. 42 no.9:20-24 3 '64. (MIRA 17:10)

SHISHKIN, Rostislav Grigor'yevich, Tikhon, L.Ye., instr., author.
red.; YEMEL'YANOVA, M.D., red.

[Precast reinforced concrete elements for single-story
industrial buildings] Sbornye zhelezobetonnye konstruktsii
odnoetazhnykh promyshlennykh zdani. Moskva, Stroiizdat,
1965. 524 p. (MIRA 18:3)

SHISHKIN, S.

Building materials from wood wastes with soluble glass.
Sel'.stroi. 16 no.2:12-13 F '62. (MIRA 15:12)

1. Nachal'nik laboratorii TSentral'nogo nauchno-issledovatel'skogo
instituta mekhanizatsii i energetiki lesnoy promyshlennosti.
(Building materials)

SHISHKIN, S.A.; KOLYBELIN, N.M.; MOROZOVA, Yu.V., red.izd-va;
KUZNETSOVA, A.I., tekhn. red.

[Precast concrete-block stoves for housing construction by
lumbering establishments] Sbornye betonoblochnye pechi dlia
zhilishchnogo stroitel'stva lespromkhozov. Sost. S.A.Shishkin,
N.M.Kolybelin. Moskva, Goslesbumizdat, 1960. 64 p.

(MIRA 15:7)

1. Khimki. Tsentral'nyy nauchno-issledovatel'skiy institut me-
khanizatsii i energetiki lesnoy promyshlennosti.

(Stoves) (Concrete blocks)

28-5-18/30

AUTHOR: Shishkin, S.M., and Zakashanskiy, N.M., Engineers

TITLE: Marking of Metals with Paint (Markirovka metallov kraskami)

PERIODICAL: Standartizatsiya, 1957, # 5, p 73-74 (USSR)

ABSTRACT: The authors of the two letters published under this title suggest different general marking systems for metals at industrial plant storeyards and workshops. There is no such system in the Soviet standards for metals. There are some regulations but they concern only a few single metal grades. For instance, alloyed tool steel and deformed aluminum alloy marking is not regulated. Many industrial plants have their own different marking systems. The marking system suggested in the first letter (Engineer Shishkin) is criticized in the second letter (Engineer Zakashanskiy).

There are 2 tables.

AVAILABLE: Library of Congress

Card 1/1

1. All, S.S.

U prednostei krov'ov p'tits. Moskva, 1936. 20 p., illus., ta les, diagra. (OS' 1. Irud', no. 258)

Summary in English.
Bibliography: p. 20.

Title tr.: The strength of birds' wings.

QA911. M65 no. 258

30. Aeronautical Science and Aviation in the Soviet Union. Library of Congress, 1955.

SHISHKIN, S. N.

SHISHKIN, S. N.

O deistvitel'nykh nagruzkakh shassi. Moskva, 1936. 40 p., tables, diagrs.
(TSAGI. Trudy, no. 269)

Summary in English.

Title tr.: Actual loads on airplane landing gears.
QA911.M65 no. 269

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of
Congress, 1955.

SHUMIN N., Prof. Sergey Nikolayevich

Dir., Central Aero. Hydrodynamics Inst. im. Zhukovskiy, -1943-. Chron., Comm. for N. Ye. Zhukovskiy Prize, -c1943-. "A Manual for Designers," 1940, 41-42; "Decree of the Soviet Ministers of the USSR, Jan. 11, 1947, on Commemorating the Memory of the Great Russian Scientist, Prof. N. Ye. Zhukovskiy," Kotloturbostroy., No. 4, 1943; "Competitions for the N. Ye. Zhukovskiy Prize and Medals," Iz. Ak. Nauk SSSR, Ser. Fiz. 12, No. 4, 1943; "Notice for Applications for Prizes and Medals imeni N. Ye. Zhukovskiy for Best Work in the Field of Aviation for 1947," Vest. Inzhenerov i Tekhnikov, No. 4, 1943;

28(3)

SOV/28-59-3-20/25

AUTHOR: Shishkin, S.N., Engineer

TITLE: Conventional Designations of Protective and Decorative Coatings (Uslovnyye oboznacheniya zashchitnykh i dekorativnykh pokrytiy)

PERIODICAL: Standartizatsiya, 1959, Nr 3, p 55 (USSR)

ABSTRACT: The author makes suggestions concerning the designation system of protective and decorative coatings to be used in the new state standard of coatings.

Card 1/1

SHISHKIN, S. N.

PA 10/49T14

USSR/Academy of Sciences
Aeronautics

Jul/Aug 48

"Notice for Applications for Prizes and Medals imeni
N. Ye. Zhukovskiy for Best Work in the Field of
Aviation for 1947," S. N. Shishkin, Committee Chm,
1 p

"Vest Inzhener i Tekhnik" No 4

First prize, 50,000 rubles and gold medal, and
second prize, 25,000 rubles and silver medal, awarded
annually to Soviet scientists. Individuals and
groups are eligible for money prize. Entries
should be sent to Prof S. N. Shishkin, P O Box 747,
Moscow.

10/49T14

PA 55/4971

USSR/Academy of Sciences

Jul/Aug 48

Awards

"Competitions for the N. Ye. Zhukovskiy Prize and Medal," S. N. Shishikh, Jury Chm, 1 p

"Iz Ak Nauk SSSR, Ser Fiz" Vol XII, No 4

N. Ye. Zhukovskiy prize and medal is awarded annually, beginning in 1947, to a Soviet scientist for outstanding work on the theory of aviation (aerodynamics, hydrodynamics, theory of combustion, and theory of strength of airplanes and motors), and for outstanding educational works on aviation subjects. First prize is 50,000 rubles and a gold

53/4971

USSR/Academy of Sciences (Contd)

Jul/Aug 48

medal. Second prize is 25,000 rubles and a silver medal.

53/4971

SHISHKIN, S.S., kand.med.nauk (Moskva)

Silent pneumonia in influenza. Klin.med. 36 no.12:75-78
D '58. (MIRA 12:6)

(INFLUENZA, compl.
pneumonia (Rus))
(PNEUMONIA, compl.
influenza (Rus))

SHISHKIN, S.S.

Parasympathetic regulation of cardiac function in rheumatic patients
and the atropine test. Terap. arkh. 32 no. 4:53-58 S '60.
(MIRA 14:1)

(RHEUMATIC HEART DISEASE) (ATROPINE)

SHISHKIN, S.S.; KONONYKHIN, V.V.

Dysentery outbreak following an influenza pandemic. Zhur.
mikrobiol.epid. i immun. 30 no.5:146 My '59. (MIRA 12:9)
(DYSENTERY)

SHISHKIN, S.S.

Electrocardiographic changes in an acute attack of rheumatic fever
and the atropine test; preliminary report. Klin. med. 38 no. 2:85-
91 F '60. (MIRA 14:1)
(ATROPINE) (RHEUMATIC FEVER) (ELECTROCARDIOGRAPHY)

SHISHKIN, Sergey Sergeyevich; SYCHEVA. I.M., red.; MATVEYEVA, M.M.,
tekhn. red.

[Recurrent infarcts of the myocardium] Povtornye infarkty
miokarda. Moskva, Medgiz, 1963. 181 p. (MIRA 16:9)
(HEART--INFARCTION)

SOV/110-58-7-1/21

AUTHOR: Voznesenskiy, S.D., Engineer, Smirnitskaya, V.P., Engineer,
and Shishkin, S.V., Engineer

TITLE: New Arc-Resisting Moulding Materials (Novyye dugostoykiye
pressmaterialy)

PERIODICAL: Vestnik Elektromychnosti, 1958, Nr 7, pp 1-6 (USSR)

ABSTRACT: The range of plastics for electrical purposes available to industry remains limited and there is particular need of arc-resisting plastics, which are often required to have high mechanical strength and to withstand moisture and heat. Besides asbestos cement products, which have poor insulating properties and low moisture-resistance, extensive use is made of moulded materials based on melamine-urea-formaldehyde resins filled with fine-grained asbestos and talc or long-grained asbestos, such as plastics VEI-11 and VEI-12. Material VEI-11 is pressed cold and shows poor mechanical strength; VEI-12, which is moulded hot, has good impact strength but poor moisture-resistance. In storage both materials soon deteriorate and become unsuitable for moulding. Other amino-plastics are K-78-51, and K-77-51, which is of similar
Card 1/6 composition. They are based on modified melamine-formaldehyde

New Arc-Resisting Moulding Materials

SOV/110-58-7-1/21

resin filled with short-grained asbestos with a small quantity of organic filler. These materials are good for instruments and some other parts but have little resistance to arcing. Materials based on silicones with mineral fillings have been developed recently, and include KMK-218 and K-41-5, which are produced in small quantities and are expensive. In 1955 the Scientific Research Institute for Plastics developed arc-resisting materials grades MFK-20 (melamine-formaldehyde silicone) and MTF-55 (melamine-urea-formaldehyde). They are much better than VEI-11 & 12 in general properties and have greater arc-resistance than other urea-melamine materials, including K-73-51 and K-77-51. In developing these resins it was found that the defects of previous resins based on trimethylamine result from the fact that during the processes of polycondensation and hardening these materials generate considerable quantities of volatiles, including formaldehyde and water. The combined melamine silicone resins used in material MFK-20 improved the water-resistance, stability and moulding properties and gave high arc- and heat-resistance.

Card 2/6 The laboratories of the Scientific Research Institute of the

New Arc-Resisting Moulding Materials

SOV/110-58-7-1/21

Electrotechnical Industry investigated the properties of plastics MFK-20, MMT-55 and KMK-218 compared with those of available plastics. Technological tests on mouldings were mostly made on arc-suppression chambers of d.c. contactors. The moulding properties of the materials examined are given in Table 1 and arc-resistance data in Table 2. The resistance of the materials to arcing was determined with a.c. at 6 - 10 kV with a distance between electrodes of 8 mm and with currents of up to 30 mA. The results show that the best in this respect is KMK-218 and the worst K-78-51. The insulating properties of the materials were determined in moist conditions and also after cyclic heating and wetting. The cycling tests consisted of three cycles with a total duration of 45 days. Each cycle included 10 days thermal ageing with subsequent wetting in a moisture chamber for 5 days. During thermal ageing plastics MMT-55, MFK-20 and K-78-51 were heated to 150°C and plastics KMK-218 and K-41-5 to 200°C. The test results are given in Tables 3 & 4, from which it will be seen that only material K-78-51 retains good insulating properties after exposure to moisture. The

Card 3/6

New Arc-Resisting Moulding Materials

30V/110-58-7-1/21

moisture-resistance was improved by 30 days thermal ageing, which apparently did not damage the materials. In addition to using electrical tests for the purpose, resistance to moisture was assessed by the amount of water absorbed by standard rods immersed for 10 days and weighed from time to time. The test results are plotted in Fig 2. The best material was K-78-51 and the worst MMT-55 and VEI-12. Technological tests on materials MTK-20 MMT-55 KMK-218 and VEI-12 were made by the Apparatus Division of the Scientific Research Institute of the Electrotechnical Industry using closed arc-suppression chambers of a single-pole d.c. contactor type KV-422 with a rated current of 200 A and voltage of 330 V. The arc is emitted through long gaps 1 mm wide. The following tests were made: verification of interruption capacity; determination of length of arc; checking of resistance to moisture. To verify the interruption capacity, the contactor was used to make and break five times rated current fifty times with a ten second interval, and then ten times rated current with a voltage of 320 V on the open contacts. The load consisted of inductance and active resistance. Examination after the tests showed

Card 4/6

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067/110-58-7-1/21

all the contactors to be in satisfactory condition and fit for further use. The order of resistance to charring, starting with the best, is KMK-218, MEF-55, MFK-20 and VEI-12. The method of measuring the arc length is explained and the results are given. The resistance to moisture was determined in a humidity chamber with 95-98% humidity at 20°C for 30 days. The insulation resistance between the bolts of the fixed contacts was measured before and after exposure. The results are given in Fig. 3, from which it will be seen that materials KMK-218, MFK-20, and MEF-55 were of good resistance to moisture whilst material VEI-12 deteriorates rapidly even when impregnated with paraffin wax. The following conclusions are drawn. The material that best resists arcing and heat is KMK-218, which also has good resistance to moisture and good moulding properties. It is, however, of low mechanical strength, scarce and expensive. Material K-41-5 is of higher impact strength and has good resistance to arcs and moisture but is very expensive, scarce and difficult to manufacture. Material K-78-51 has the best insulating properties and moisture resistance and good moulding properties. However,

Card 5/6